

Message Text

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FM AMEMBASSY PARIS

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INFO AMEMBASSY BONN

AMEMBASSY MADRID

AMEMBASSY ROME

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AMEMBASSY TOKYO

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AMEMBASSY LONDON

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UNCLAS SECTION 01 OF 09 PARIS 00141

DEPT FOR OES/SCI, PASS AEC

E.O. 11652: N/A

TAGS: TGEN, TECH

SUBJECT: OVERVIEW OF FRENCH NUCLEAR PROGRAM

REF: A) PARIS A-521, 7 OCT 1974 (NOTAL); B) PARIS

A-341, 8 MAY 1973 (NOTAL)

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1. SUMMARY: THE BASIC OBJECTIVES OF THE FRENCH

NUCLEAR PROGRAM ARE TO EXPAND DOMESTIC NUCLEAR POWER CAPACITY, BUILD AN INDEPENDENT NUCLEAR INDUSTRY, CONTAIN DOMESTIC NUCLEAR PROTEST MOVEMENTS, ORIENT NUCLEAR RESEARCH TOWARD INDUSTRIAL APPLICATIONS, INCREASE NUCLEAR EXPORTS, AND AUGMENT NATIONAL, TECHNICAL, AND FINANCIAL RESOURCES THROUGH INTERNATIONAL COOPERATION. MORE SPECIFICALLY:

NUCLEAR POWER: GOF HAS ORDERED SIX 900 MEGAWATT NUCLEAR POWER STATIONS IN 1974 AND SEVEN IN 1975. LONG-TERM PLANS TO ORDER SIX PER YEAR FROM 1976 TO 1980 WILL BE RECONSIDERED AT A MEETING AT THE ELYSEE IN MID-JANUARY. SUCH AN AMBITIOUS PROGRAM WOULD PUT IN OPERATION BY 1985 SOME 50 NUCLEAR POWER STATIONS GENERATING 70 PERCENT OF FRANCE'S ELECTRIC POWER, OR 28 PERCENT OF ITS TOTAL ENERGY NEEDS.

NATURAL URANIUM: SINCE 1965, THE FRENCH HAVE DOUBLED PRODUCTION /OF NATURAL URANIUM IN FRANCE AND WEST AFRICA TO AN ESTIMATED 3,380 TONS FOR 1974. OVER 1,200 TONS ARE EXPORTED. LONG-RANGE PLANS CALL FOR FRENCH PRODUCTION TO STAY AT 10 TO 15 PERCENT OF WORLD PRODUCTION.

ENRICHMENT: CONSTRUCTION HAS BEGUN ON THE \$2.5 BILLION EURODIF ENRICHMENT COMPLEX. THE PLANT'S FUTURE PRODUCTION OF 10.7 MILLION SEPARATIVE WORK UNITS IS ALREADY COMMITTED TO THE COUNTRIES PARTICIPATING IN EURODIF: SPAIN, ITALY, BELGIUM AND FRANCE, AS WELL AS TO JAPAN, SWITZERLAND, AND GERMANY. THE FRENCH HOPE TO USE THEIR GASEOUS DIFFUSION TECHNOLOGY FOR A SECOND ENRICHMENT PLANT IN EITHER AUSTRALIA, EUROPE OR CANADA. THEY FEEL THEY CAN WAIT A YEAR OR MORE BEFORE DECIDING.

REPROCESSING: THE LA HAGUE CENTER IS SCHEDULED TO BEGIN REPROCESSING WASTES FROM LIGHT WATER REACTORS BY THE END OF 1975. A PROCESS FOR VITRIFYING HIGH-LEVEL WASTES IS PLANNED TO BEGIN OPERATION BY 1981.

ENVIRONMENT: THE ACCELERATION OF THE NUCLEAR POWER PROGRAM DECIDED AT THE ELYSEE IN MARCH 1974 HAS DRAWN SHARP CRITICISM, ESPECIALLY FROM LOCAL LEVELS. IN RESPONSE, THE GOVERN-

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MENT IS UNDERTAKING A SPECIAL PUBLIC INFORMATION PROGRAM.

RESEARCH & DEVELOPMENT: CONSTRUCTION OF THE 1,200 MEGAWATT SUPERPHENIX FAST BREEDER POWER REACTOR IS SCHEDULED TO BEGIN IN 1975, PROVIDED THE 250 MEGAWATT DEMONSTRATION BREEDER, THE PHENIX, OPERATES SATISFACTORILY FOR A YEAR, AND NECESSARY CAPITAL CAN BE RAISED. IN ITS FIRST NINE MONTHS

OF FULL OPERATION, PHENIX HAS SURPASSED EXPECTATIONS,
OPERATING AT OVER 80 PERCENT OF CAPACITY.

SAFEGUARDS: WITH FRANCE EMERGING AS AN IM-
PORTANT NUCLEAR EXPORTER, ITS INDEPENDENT SAFEGUARDS
POLICY MAY INCREASINGLY HINDER THE DEVELOPMENT OF AN
EFFECTIVE INTERNATIONAL EFFORT TO CONTROL PROLIFERA-
TION OF NUCLEAR EXPLOSIVES. WE HAVE SEEN NO PERSUA-
SIVE SIGNS THAT FRANCE WILL MODERATE ITS PRESENT
ALOOFNESS FROM INTERNATIONAL SAFEGUARDS OBLIGATIONS.

INDEPENDENCE: THE GOAL OF FRENCH PLANNERS,
AN INDEPENDENT NUCLEAR INDUSTRY, DOES NOT PRECLUDE
EXTENSIVE INTERNATIONAL COOPERATION. THE FRENCH

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TEND, HOWEVER, TO AVOID MULTILATERAL COMMITMENTS WHICH LIMIT THEIR FREEDOM OF ACTION OR IDENTIFY FRANCE WITH A BLOC OF INDUSTRIAL NATIONS VIS-A-VIS ITS THIRD WORLD CLIENTS. END SUMMARY.

2. ON THE RHONE RIVER, 30 KILOMETERS NORTH OF
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LYON, 2,000 MEN ARE WORKING ON ONE OF THE LARGEST NUCLEAR POWER COMPLEXES IN THE WORLD. WHEN COMPLETED IN 1980, THE FIVE NUCLEAR POWER STATIONS AT BUGEY WILL HAVE AN ELECTRICAL CAPACITY OF 4,200 MEGAWATTS, OR EIGHT TIMES THE NEEDS OF LYON. THE COST IS ESTIMATED AT \$1.5 BILLION.

3. FURTHER DOWN THE RHONE VALLEY ABOUT HALFWAY BETWEEN LYON AND MARSEILLES IS THE SITE OF AN EVEN LARGER NUCLEAR PROJECT: THE EURODIF URANIUM ENRICHMENT COMPLEX AT TRICASTIN, PROBABLY THE LARGEST SINGLE PROJECT IN FRANCE. ITS CONSTRUCTION WILL REQUIRE \$2.5 BILLION, 7 YEARS, A WORK FORCE REACHING A MAXIMUM OF 8,000, A MILLION TONS OF CEMENT, AND 100,000 TONS OF STEEL. WORK HAS ALREADY BEGUN TO CLEAR GROUND, BUILD HOUSING, AND IMPROVE THE TRANSPORTATION SYSTEM. REPORTEDLY CEMENT IS BEING POURED AND ORDERS WORTH HALF A BILLION DOLLARS HAVE BEEN MADE FOR EQUIPMENT FOR THE LOW AND MEDIUM STAGES. FOUR 900 MEGAWATT NUCLEAR PLANTS WILL POWER THE GASEOUS DIFFUSION SEPARATION PROCESS, DEVELOPED BY THE FRENCH AT THE ADJOINING PIERRELATTE ENRICHMENT PLANT WHICH THEY BUILT IN 1967 TO MEET THE NATION'S MILITARY NEEDS FOR HIGHLY ENRICHED URANIUM.

4. IN 1973, NUCLEAR ENERGY SUPPLIED ONLY 8.5 PERCENT OF FRENCH ELECTRICITY PRODUCTION. LONG-RANGE PLANS DRAWN UP BY THE GOVERNMENT FOLLOWING THE LATE 1973 OIL EMERGENCY CALL FOR ORDERS OF SIX OR SEVEN NUCLEAR POWER STATIONS OF 900 TO 1,000 MW PER YEAR UNTIL 1980. THUS, BY 1985, FRENCH COULD START UP 50 NUCLEAR POWER PLANTS, SUPPLYING 70 PERCENT OF FRANCE'S RAPIDLY GROWING NEEDS FOR

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7. THE FRENCH INTEND TO GROUP THEIR NUCLEAR POWER PLANTS INTO PARKS LIKE BUGEY. HOWEVER, SUCH CONCENTRATIONS OF POWER PRODUCTION AND THE ATTENDANT NEED TO DISSIPATE WASTE HEAT COULD POSE SEVERE ENVIRONMENTAL STRESSES. IN THE CASE OF BUGEY, THE FRENCH WILL BUILD HUGE 130 METER COOLING TOWERS FOR BUGEY IV AND V.
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OTHERWISE, THE HEAT REJECTED INTO THE RHONE RIVER WOULD RAISE THE TEMPERATURE OF THE RECEIVING WATERS BEYOND GOVERNMENT-SET LIMITATIONS OF 30 DEGREES CENTIGRADE. (REPORTEDLY, EDF ESTIMATES THAT IN 10 YEARS, THE TEMPERATURE OF THE RHONE AT BUGEY WILL RISE FOUR TO SEVEN DEGREES CENTIGRADE AND AT PIERRELATTE THREE TO FIVE DEGREES).

8. GIVEN THE HIGH COST OF LOANS AND ITS OWN FINANCIAL DIFFICULTIES, EDF IS HARD-PRESSED TO FINANCE THE AMBITIOUS NUCLEAR PROGRAM WITHOUT GOVERNMENT SUBSIDIES. THE GOVERNMENT HAS SO FAR DECLINED TO RAISE ELECTRICITY RATES SUFFICIENTLY BOTH TO COVER INCREASED COSTS OF OIL AND TO RAISE CAPITAL FOR THE HEAVY INVESTMENTS NEEDED FOR THE EXPANSION PLANS. THUS EDF FACES AN UNUSUALLY LARGE DEFICIT OF AT LEAST \$300 MILLION FOR 1974 INSTEAD OF THE NEAR BALANCE ACHIEVED IN THE 3 PREVIOUS YEARS. AS A RESULT, EDF HAS BORROWED HEAVILY IN 1974, REPORTEDLY A BILLION DOLLARS.

WITHOUT A SUBSTANTIAL RATE INCREASE, THERE IS LITTLE RELIEF IN SIGHT FOR EDF, IF IT PURSUES ITS ACCELERATED CONSTRUCTION PROGRAM. THE GOVERNMENT, HOWEVER, FACES A DILEMMA. RAISING RATES WOULD INCREASE THE COST OF LIVING. NOT RAISING RATES WOULD PUT EDF HEAVILY IN DEBT, MERELY POSTPONING THE PAYMENT PROBLEM AND, BY ENCOURAGING CONSUMPTION, WOULD WORK AGAINST GOVERNMENT'S EFFORTS TO CONSERVE ENERGY. THUS, AT A HIGH LEVEL INTERAGENCY MEETING ON DECEMBER 10, THE FINANCE MINISTRY IS REPORTED TO HAVE OPPOSED THE ACCELERATED NUCLEAR POWER PROGRAM, PREFERRING A SCENARIO OF ORDERING 20 PLANTS IN 5 YEARS (INSTEAD OF 3 YEARS) WITH 40 TO 45 IN OPERATION BY 1985 (INSTEAD OF 50-55). THE COUNCIL FOR ENERGY PLANNING WILL CONSIDER THE PROGRAM AT THE ELYSEE IN JANUARY.

9. ACHIEVE INDEPENDENCE IN ALL ASPECTS OF NUCLEAR POWER PRODUCTION
NATURAL URANIUM: FRENCH PUBLIC AND PRIVATE ENTERPRISES CONTROL ABOUT 10 TO 15 PERCENT OF THE WORLD'S PRODUCTION OF NATURAL URANIUM. WITH ADEQUATE DOMESTIC RESERVES (ESTIMATED 60,000 TONS AT LESS THAN UNCLASSIFIED

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\$15 PER POUND), OWNERSHIP OF MINES IN GABON (25,000 TONS) AND IN NIGER (60,000 TONS), AND AN AGGRESSIVE PROGRAM OF EXPLORATION IN THESE AND OTHER COUNTRIES, THE FRENCH ARE INTENT ON MAINTAINING THEIR

SHARE OF WORLD URANIUM PRODUCTION AT ABOUT 10 OR 15 PERCENT. THROUGH URANEX, A COMMERCIAL SUBSIDY OF THE FRENCH NUCLEAR AGENCY, THE COMMISSARIAT A L'ENERGIE ATOMIQUE (CEA), THE FRENCH EXPORT NATURAL URANIUM (1,260 TONS ESTIMATED IN 1974) AS WELL AS MEET ALL THEIR DOMESTIC NEEDS (2,000 TONS ESTIMATED 1974).

10. ENRICHMENT: WHEN DE GAULLE DECIDED TO SWITCH TO LIGHT WATER REACTORS IN 1969, FRANCE BECAME DEPENDENT ON OUTSIDE SOURCES (THE U.S. AND THE SOVIET UNION) TO ENRICH URANIUM. THEY PROBABLY NEVER INTENDED TO LET THAT DEPENDENCE CONTINUE. TWO YEARS LATER, THE FRENCH JOINED WITH SPANISH, ITALIAN, AND BELGIAN PARTNERS IN THE EURODIF CONSORTIUM. BASED ON FRENCH RESEARCH AND AN EXTENSIVE ECONOMIC FEASIBILITY STUDY, EURODIF DECIDED IN LATE 1973 TO PROCEED WITH THE DEVELOPMENT OF AN ENRICHMENT PLANT USING FRENCH GASEOUS DIFFUSION TECHNOLOGY AND FRENCH POWER SOURCES. THE EURODIF ENRICHMENT COMPLEX IS SCHEDULED TO BEGIN PARTIAL OPERATION BY 1979, WITH FULL PRODUCTION OF 10.7 MILLION SEPARATIVE WORK UNITS (SWU'S) EXPECTED BY 1981. THE PLANT'S PRODUCTION IS ALREADY COMMITTED FOR SALE TO THE PARTICIPATING COUNTRIES IN EURODIF, JAPAN (1 MILLION SWU'S A YEAR FROM 1980 TO 1990); SWITZERLAND (100,000 SWU'S FOR SAME PERIOD); AND GERMANY (600,000 SWU'S IN 1981 AND AGAIN 1984).

11. THE FRENCH SHARE IN EURODIF PLUS ENRICHMENT CONTRACTS WITH THE U.S. AND USSR ARE SUFFICIENT TO COVER DOMESTIC NEEDS FOR ENRICHMENT UNTIL ABOUT 1983.

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THE FRENCH ARE CONSIDERING USING THEIR GASEOUS
DIFFUSION TECHNOLOGY FOR A SECOND PLANT EITHER IN
EUROPE OR IN A COUNTRY POSSESSING URANIUM RESERVES
LIKE CANADA OR AUSTRALIA. FINANCING, HOWEVER, RE-
MAINS AN UNRESOLVED PROBLEM. CEA DEPUTY ADMINIS-
TRATOR PECQUEUR, AN ENRICHMENT SPECIALIST, SEES
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LITTLE PROBLEM OF A WORLD OVERCAPACITY AROUND
1985 IF A SECOND PLANT WERE TO BE BUILT USING
FRENCH TECHNOLOGY. HE REASONS THAT ANY
SUCH OVERCAPACITY WOULD BE SHORTLIVED' OWING TO THE
HIGH PROBABLE GROWTH RATE IN ENRICH-
MENT DEMAND AND WOULD GIVE THE EUROPEANS AN OPPORTU-
NITY TO DEVELOP A COMFORTABLE STOCKPILE. IN ANY
CASE, HE FEELS THE FRENCH HAVE A YEAR OR TWO BEFORE
A DECISION ON A SECOND PLANT IS NECESSARY.

12. POWER REACTORS: THOUGH USING WESTINGHOUSE
AND GE LICENSEES, THE FRENCH GOVERNMENT NEVER-
THELESS ENCOURAGES INDEPENDENCE FROM FOREIGN SUP-
PLIES OF ESSENTIAL NUCLEAR EQUIPMENT. REPORTEDLY
FROM 80 TO 95 PERCENT OF THE EQUIPMENT IN FRENCH

NUCLEAR REACTORS NOW UNDER CONSTRUCTION WILL BE MANUFACTURED IN FRANCE. HOWEVER, FRENCH INDUSTRY WILL BE HARD-PRESSED TO EXPAND TO MEET THE DEMANDS OF THE EXPANDED NUCLEAR PROGRAM WITHOUT HEAVIER IMPORTS. FOR EXAMPLE, THE PRESSURE VESSELS FOR THE TWO BOILING WATER REACTORS ON ORDER WILL BE SUPPLIED BY BRED A OF ITALY. BEYOND 1985, THE FRENCH HOPE TO BE IN A POSITION TO SWITCH TO THEIR OWN DESIGN OF THE SECOND GENERATION REACTORS, THE FAST BREEDER. THERE SEEMS LITTLE QUESTION THAT THE FRENCH HAVE THE CAPABILITY TO PROCEED INDEPENDENTLY IF FOR SOME REASON THEY WERE CUT OFF FROM LICENSES AND ASSISTANCE FROM FOREIGN MANUFACTURERS.

13. REPROCESSING AND STORAGE: FRANCE'S PRINCIPAL FACILITIES FOR REPROCESSING AND STORING RADIOACTIVE WASTES FROM CIVILIAN NUCLEAR REACTORS ARE AT THE LA HAGUE CENTER. TO MINIMIZE RISKS TO MAN AND THE ENVIRONMENT, THE 270-HECTARE CENTER WAS SITED ON A BARREN, WINDSWEPT, SPARSELY POPULATED PLATEAU, RISING 180 METERS ABOVE THE OCEAN ON THE FURTHEST WESTERLY POINT OF NORMANDY. THE RETREATMENT PLANT NOW REPROCESSES SPENT FUEL FROM GAS GRAPHITE NUCLEAR REACTORS. ADDITIONAL CAPACITY TO HANDLE SPENT FUEL FROM LIGHT WATER REACTORS IS EXPECTED TO GO INTO OPERATION BY THE END OF UNCLASSIFIED

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1975. THE PLUTONIUM RECOVERED IN THE RETREATMENT PROCESS IS STORED FOR FUTURE USE IN FAST BREEDER REACTORS. (THE FRENCH, HOWEVER, HAVE NOT YET DROPPED THE OPTION OF RECYCLING PLUTONIUM IN ADAPTED LIGHT WATER REACTORS.) HIGH LEVEL WASTES ARE STORED ON SITE. PLANS CALL FOR INSTALLATION BY 1981 OF A NEW PROCESS TO VITRIFY (CONVERT INTO GLASS) HIGH LEVEL WASTES TO MAKE STORAGE EASIER AND SAFER. STORAGE OF LOW LEVEL WASTES AT LA HAGUE IS HANDLED BY INFRATONE, A CEA COMMERCIAL SUBSIDIARY.

14. STAYING AHEAD OF ENVIRONMENTAL CRITICS: UNTIL RECENTLY, DOMESTIC CRITICISM OF THE FRENCH NUCLEAR POWER PROGRAM HAS BEEN MUTE IN COMPARISON WITH THE LIVELY ENVIRONMENTAL DEBATE ON NUCLEAR POWER IN THE U.S. ONE EXPLANATION FOR THIS IS THE PUBLIC INFORMATION PROGRAM CARRIED ON AGGRESSIVELY BY EDF AND CEA. ANOTHER IS THE RELATIVELY SMALL SIZE OF EXISTING FRENCH NUCLEAR POWER CAPACITY (2,500 MEGAWATTS). IN ADDITION, THE ECOLOGY MOVEMENT IN FRANCE HAS YET TO DEVELOP ARTICULATE PRESSURE GROUPS, PERHAPS OWING TO THE CHARACTERISTIC

INABILITY OF THE FRENCH TO ORGANIZE THEMSELVES
ON GROUNDS OTHER THAN IDEOLOGY AND VACATIONS.

15. IN THE PAST HALF YEAR, HOWEVER, OPPOSITION FORCES HAVE MADE THEMSELVES HEARD ON TWO COUNTS: 1) THE FAILURE OF THE GOVERNMENT TO CONSULT ON ITS DECISION TO GO NUCLEAR; AND 2) THE ADEQUACY OF ITS PRECAUTIONS TO PROTECT THE ENVIRONMENT. THE OPPOSITION BEGAN TO COALESCE FOLLOWING THE MARCH 4 ELYSEE DECISION TO INCREASE THE RATE OF NUCLEAR POWER PLANT CONSTRUCTION FROM 2 TO 6 PER YEAR. SHORTLY THEREAFTER, CAME A PRESS STATEMENT BY A FORMER HIGH OFFICIAL IN THE ENVIRONMENTAL

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MINISTRY CRITICIZING THE DECISION FOR
BEING TOO HASTY. GISCARD TOO IN HIS MAY ELECTION
CAMPAIGN RECOGNIZED THE MOUNTING PUBLIC PRESSURE
AND PROMISED A NATIONAL ECOLOGICAL COMMITTEE TO
STUDY THE NUCLEAR POWER DOSSIER (AS YET UNKEPT).
THE FRENCH PRESS, PARTICULARLY SINCE SEPTEMBER,
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HAS GIVEN HEAVY COVERAGE TO THE DEBATE ON NUCLEAR
POUER.

16. THE MOST EFFECTIVE CRITICISM HAS COME FROM THE
LOCAL LEVELS OUTSIDE PARIS: TRADE ASSOCIATIONS,
ENVIRONMENTAL GROUPS, LOCALLY ELECTED OFFI-
CIALS, AND REPRESENTATIVES IN PARLIAMENT. THIS
FALL HAS WITNESSED, FOR EXAMPLE, A PROTEST DEMON-
STRATION AT PIERRELATTE AGAINST THE EURODIF CON-
STRUCTION, PETITIONS FROM BORDEAUX WINE MERCHANTS
(INSPIRED BY A TALK GIVEN BY THE AMERICAN NUCLEAR
CRITIC, DR. ARTHUR TAMPLIN), AND A CONDEMNATION
OF THE GOVERNMENT BY SEN. MAURICE PIC FOR FAILING
TO CONSULT AND INFORM THE PUBLIC. THAT THE PARISIAN
THEMSELVES DO NOT HAVE TO CONTEMPLATE LIVING NEAR A
NUCLEAR STATION MAY EXPLAIN THE MODERATE DEGREE
OF DEBATE IN THE CAPITAL AND MORE GENERALLY WHY
THE ECOLOGICAL PROTEST HAS NOT DRAWN MORE ATTEN-
TION IN THIS PARIS-CENTERED COUNTRY.

17. EVEN WITHIN THE GOVERNMENT, SOME SECOND
THOUGHTS HAVE BEEN EXPRESSED PUBLICALLY. RECENTLY,
THE THEN STATE SECRETARY (JUNIOR MINISTER) FOR
THE ENVIRONMENT GABRIEL PERRONET, TOOK THE UNHEARD
OF STEP OF WRITING A FRONT PAGE ARTICLE FOR LE
MONDE, CALLING FOR RESTRAINT AND PRECAUTION IN
EXPANDING NUCLEAR ENERGY. THE ARTICLE, CALM STUFF
BY U.S. STANDARDS, WAS THE FIRST CRITICISM OF
THE NUCLEAR PROGRAM BY A MEMBER OF THE GOVERNMENT.
IT ALSO MARKED THE ENTRY OF THE MINISTRY FOR THE
QUALITE DE LA VIE ONTO GROUNDS PREVIOUSLY RESERVED
FOR THE CEA AND EDF.

18. IN RESPONSE TO MOUNTING OPPOSITION, THE GOVERNMENT IS UNDERTAKING A NEW AND "VAST" PUBLIC INFORMATION PROGRAM. IN LATE NOVEMBER, MINISTER OF INDUSTRY AND RESEARCH D'ORNANO OPENED THE CAMPAIGN BY MEETING WITH THE PREFECTS AND INSTRUCTING THEM TO PASS ON INFORMATION TO LOCAL AND REGIONAL OFFICIALS. FOR THE FIRST TIME REGIONAL AND LOCAL COUNCILS COMPOSED OF ELECTED OFFICIALS UNCLASSIFIED

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WILL BE GIVEN THE OPPORTUNITY TO CONSIDER EDF'S NUCLEAR SITING PLANS. ABOUT 40 POSSIBLE SITES FOR REACTOR PARKS HAVE BEEN SELECTED PROVISIONALLY, OF WHICH ABOUT A DOZEN WILL BE CHOSEN. PARLIAMENT WILL HOLD A SPECIAL DEBATE ON NUCLEAR POWER, PROBABLY IN EARLY SPRING.

19. DESPITE THE MOUNTING CRITICISM, ENVIRONMENTAL CONCERN IS UNLIKELY TO RETARD THE NUCLEAR PROGRAM. THE AVERAGE FRENCHMAN IS WELL AWARE OF FRANCE'S PRECARIOUS ENERGY SITUATION AND IF FRANCE IS TO MEET ITS GROWTH NEEDS WITHOUT BANKRUPTING ITSELF BY IMMENSE ENERGY IMPORTS, IT WILL HAVE TO GO NUCLEAR. MOREOVER, LOCAL AUTHORITIES WILL BE HARDPRESSED TO PASS UP THE ECONOMIC BENEFITS OFFERED BY THE CONSTRUCTION OF NUCLEAR PLANTS.

20. ORIENT THE NUCLEAR RESEARCH AND DEVELOPMENT TOWARD INDUSTRIAL APPLICATIONS: WHEN THE PRESENT ADMINISTRATOR OF THE CEA, ANDRE GIRAUD, CAME ABOARD IN 1970, THE CEA HAD ACCOMPLISHED ITS MAJOR GOAL: TO ACHIEVE A NUCLEAR WEAPONS CAPABILITY. ITS ECONOMIC ROLE, HOWEVER, LAGGED. ARMED WITH A NEW DECREE (NO. 70-878, SEPT 29, 1970), GIRAUD SET ABOUT TO ORIENT THE AGENCY'S RELATIVELY VAST CAPABILITIES (27,000 EMPLOYEES AND A BUDGET EXCEEDING \$1 BILLION) TOWARD INDUSTRY AND COMMERCE AND LESS TOWARD MILITARY AND SCIENTIFIC APPLICATIONS. HE ESTABLISHED MORE COMMERCIAL SUBSIDIARIES PARTIALLY OR WHOLLY OWNED BY CEA. THE MOST IMPORTANT NEW SUBSIDIARY IS TECHNICATOME, FORMED IN JUNE 1972 FROM THE CEA REACTOR CONSTRUCTION DEPARTMENT. TECHNICATOME'S MISSION IS TO COMMERCIALIZE THE ELECTRO-NUCLEAR TECHNOLOGY DEVELOPED BY THE CEA. IN ADDITION, THE CEA IS REPRESENTED BY ITS WHOLLY OWNED SUBSIDIARY SERU IN EURODIF IN THE PROPOSED URANIUM ENRICHMENT

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AF-06 CIEP-02 FPC-01 SAM-01 CEQ-01 EPA-04 CEA-01

XMB-04 MC-02 NEA-09 /158 W
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R 031633Z JAN 75

FM AMEMBASSY PARIS

TO SECSTATE WASHDC 5552

INFO AMEMBASSY BONN

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AMEMBASSY BRUSSELS

AMEMBASSY TOKYO

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AMEMBASSY LONDON

AMEMBASSY COPENHAGEN

AMEMBASSY LUXEMBOURG

AMEMBASSY OTTAWA

USMISSION EC BRUSSELS

USMISSION IAEA VIENNA

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VENTURE IN CANADA.

21. GIRAUD IS GENERALLY CREDITED WITH SUBSTANTIAL
SUCCESS IN ACHIEVING THIS INCREASED INDUSTRIAL
ORIENTATION. THE CEA PARTICIPATES IN
VIRTUALLY ALL COMMERCIAL ASPECTS OF NUCLEAR IN-
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DUSTRY EXCEPT FOR THE ACTUAL CONSTRUCTION OF CONVENTIONAL REACTORS, WHERE EDF PLAYS THE MAIN ROLE. IT EVEN WORKS WITH THE FRENCH OCEAN AGENCY (CNEXO) AND LE NICKEL IN DEVELOPING TECHNOLOGY FOR MINING MANGANESE NODULES. IN ADDITION, THERE IS CONTINUED PRESS SPECULATION THAT THE CEA MAY TAKE OVER RESPONSIBILITY FOR MANAGING THE FRENCH GOVERNMENT'S COSTLY EFFORTS TO DEVELOP AN INDEPENDENT COMPUTER CAPABILITY. FINALLY, THE CEA'S EARNINGS MAINLY FROM THE SALES OF NATURAL URANIUM FUEL ELEMENTS, ENRICHED URANIUM, ETC., INCREASED BY 25 PERCENT IN 1973 TO A TOTAL OF 736 MILLION FRANCS (\$150 MILLION) IN 1974.

22. A LOOK AT THE \$200 MILLION BUDGET OF THE CEA'S INDUSTRIAL NUCLEAR APPLICATIONS DIVISION SHOWS WHAT DIRECTION THE FRENCH NUCLEAR PROGRAM WILL TAKE IN THE FUTURE. THE LARGEST SECTOR IS THE FAST BREEDER PROGRAM (35 PERCENT), NEXT COMES CIVIL AND MILITARY NAVAL PROVISION WITH 21 PERCENT, FOLLOWED BY URANIUM ENRICHMENT AT 15 PERCENT, THE LIGHT WATER REACTOR AT 10 PERCENT, AND THE HIGH TEMPERATURE GAS REACTOR AT 8 PERCENT.

23. THE FRENCH FAST BREEDER IS THE CENTERPIECE OF THE CEA'S RESEARCH AND DEVELOPMENT PROGRAM. THE SUCCESS OF THE PHENIX DEMONSTRATION BREEDER REACTOR TO DATE HAS SURPASSED EVEN ITS DESIGNER'S EXPECTATIONS AND MADE IT THE PRIDE OF ADVANCED FRENCH TECHNOLOGY. PHENIX FIRST WENT CRITICAL ON AUG 3L, 1973, PRODUCED ELECTRICITY FOR THE NATIONAL GRID ON DEC 13, 1973, AND REACHED FULL POWER OF ABOUT 250 MEGAWATTS ON MARCH 14, 1974. ACCORDING TO A CEA PUBLIC STATEMENT, THE PHENIX HAS PRODUCED OVER A BILLION KILOWATT HOURS, WITH AN AVERAGE LOAD FACTOR OF 81 PERCENT. IF THE PHENIX CONTINUES TO PERFORM SATISFACTORILY FOR A YEAR, A TRI-NATIONAL COMBINE WILL COMMENCE THE CONSTRUCTION OF A COMMERCIAL-SIZE 1,200 MEGAWATT FAST BREEDER (SUPERPHENIX) AT MALVILLE, FRANCE, THOUGH FINANCIAL OBSTACLES REMAIN.

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24. IN THE AREA OF LIGHT WATER REACTORS, THE CEA IS DEVELOPING SMALL REACTORS, BASED ON THE DESIGN

POWERING FRENCH NUCLEAR SUBMARINES, BOTH AS NUCLEAR PROPULSION SYSTEMS FOR TANKERS AND CONTAINER VESSELS, AND AS SOURCES OF BOTH ELECTRICITY AND HEATING. THE FRENCH GOVERNMENT HAS ORDERED A NUCLEAR POWERED HELICOPTER CARRIER AND IN PRINCIPLE, A MERCHANT VESSEL ALSO NUCLEAR POWERED. USE OF A 100 MEGAWATT REACTOR TO PROVIDE ELECTRICITY AND HEAT IS UNDER EVALUATION FOR THE THREE SITES: ROUEN, SACLAY, AND GRENOBLE. (THE MAYOR OF GRENOBLE, FORMERLY AN ASSISTANT DIRECTOR AT A CEA LAB, IS A STRONG PARTISAN OF NUCLEAR POWER.) PLANS CALL ALSO FOR BUILDING A SMALL LWR IN TAHITI. REMAINING RESEARCH ON LWR'S PRINCIPALLY CONCERNS SAFETY AND DESIGN IMPROVEMENTS AS WELL AS "PROJECT CHAMPLAIN," AN ATTEMPT TO PRODUCE AN ALL-FRENCH LWR, THUS RELIEVING FRANCE OF RELIANCE ON WESTINGHOUSE AND GE REACTORS.

25. RESEARCH ON URANIUM ENRICHMENT IS MAINLY DEVOTED TO THE EURODIF GASEOUS DIFFUSION PROCESS. IN COOPERATION WITH GENERAL ATOMICS INTERNATIONAL, THE CEA IS DOING RESEARCH ON HIGH TEMPERATURE GAS-COOLED REACTORS (HTGR). HOWEVER, THE FRENCH DO NOT PLAN TO USE THE HTGR IN THEIR CURRENT NUCLEAR POWER PROGRAM. THEY LOOK UPON THE HTGR AS A POSSIBLE FUTURE SOURCE OF PROCESS HEAT FOR INDUSTRIAL APPLICATIONS; FOR EXAMPLE, GAZ DE FRANCE, THE STATE GAS UTILITY, IS STUDYING THE USE OF THE HTGR TO PROVIDE HEAT FOR PRODUCING HYDROGEN.

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FM AMEMBASSY PARIS
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INFO AMEMBASSY BONN
AMEMBASSY MADRID
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AMEMBASSY TOKYO
AMEMBASSY THE HAGUE
AMEMBASSY LONDON
AMEMBASSY COPENHAGEN
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26. THE CEA IS STUDYING THE POSSIBILITIES IN
THE USE OF WASTE HEAT FROM REACTORS FOR HEATING
AND FOR AGRICULTURE. ONE SUCH APPLICATION IS
THE PLAN TO USE HEATED WATER FROM ST.-LAURENT-DES-
EAUX NUCLEAR PLANT FOR 3,000 M2 OF GREENHOUSES
USED TO RAISE VEGETABLES. FOR THE LONGER
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TERM, THE CEA IS RESEARCHING POWER GENERATION BY
FUSION. WORK ON PLASMA CONFINEMENT IS BEING
DONE AT FONTENAY-AUX-ROSES, USING ONE OF THE WORLD'S
LARGEST TOKOMAK MACHINES. IN ADDITION, RESEARCH
TEAMS AT THE LIMEIL CENTER ARE MAKING USE OF THE
EXCELLENT FRENCH LASER CAPABILITY TO INVESTIGATE
LASER FUSION TECHNIQUES.

27. EXPAND NUCLEAR EXPORTS: THE AMBITIONS OF
FRANCE FOR INDEPENDENCE IN THE BIG TECHNOLOGIES
LIKE AEROSPACE AND NUCLEAR ENERGY CLEARLY OUT-
STRIP THE SIZE OF THE NATION. ITS DOMESTIC
MARKET IS TOO SMALL TO ABSORB MODERN AIRCRAFT,
NUCLEAR REACTORS, AND SPACE LAUNCHERS IN SUFFICIENT
NUMBERS TO BRING COSTS DOWN TO COMPETITIVE LEVELS.
HENCE EXPORT IS DEEMED ESSENTIAL. ONE OF THE
REASONS RECENTLY GIVEN BY EDF DEPUTY DIRECTOR

GENERAL CHARLES CHEVRIER TO EXPLAIN THE SWITCH IN 1969 FROM GAS GRAPHITE TO LIGHT WATER REACTORS WAS THAT OTHERWISE "THERE WAS LITTLE OR NO CHANCE FOR FRANCE IN THE REACTOR EXPORT FIELD, SINCE MOST OF THE REST OF THE WORLD IS GOING TO LWR'S." (THE OTHER REASON WAS THAT LWR IS MORE COST EFFECTIVE.)

28. THE FRENCH HAVE BUILT "BORDER" REACTOR POWER STATIONS IN SPAIN AND BELGIUM. THEY ARE PARTICIPATING IN THE CONSTRUCTION OF A BOILING WATER REACTOR IN SWITZERLAND. THEY HAVE AGREED TO SUPPLY IRAN WITH A NUCLEAR POWER CAPACITY OF 5,000 MEGAWATTS FOR ELECTRICAL POWER AND DESALINATION. IN MID-NOVEMBER, FRAMATONE AND THE IRANIANS CONFIRMED THIS AGREEMENT IN PART WHEN THEY SIGNED A LETTER OF INTENT FOR CONSTRUCTION OF 2 NUCLEAR POWER PLANTS OF 900 MEGAWATTS, WITH THE CEA AGREEING SEPARATELY TO PROVIDE FUEL AS WELL AS TECHNICAL ASSISTANCE. THE FRENCH ARE BIDDING TO BUILD POWER STATIONS IN SOUTH AFRICA AND SWITZERLAND, AND ARE NEGOTIATING THE SALE OF REPROCESSING PLANTS TO SOUTH KOREA AND PAKISTAN. THEY HAVE ALSO RECEIVED A PROPOSAL FROM LIBYA AND UNCLASSIFIED

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ARE TALKING TO VARIOUS OTHER COUNTRIES, INCLUDING IRAQ, ON NUCLEAR SALES. THIS SALESMANSHIP, PLUS THE ONGOING EXPANSION OF DOMESTIC INDUSTRIAL CAPACITY TO AT LEAST 8 NUCLEAR POWER PLANTS PER YEAR, LEAVES LITTLE DOUBT THAT THE FRENCH HOPE TO GAIN A LARGE AND LASTING POSITION IN THE WORLD NUCLEAR MARKET.

29. FRENCH NUCLEAR EXPORTS RAISE A SERIOUS POLICY PROBLEM, AS THE FRENCH REFUSE TO ACCEPT NOT ONLY THE NONPROLIFERATION TREATY BUT ALSO INTERNATIONAL OBLIGATIONS TO SAFEGUARD EXPORTS OF NUCLEAR MATERIAL AND EQUIPMENT. INSTEAD, THEY DETERMINE SAFEGUARDS INDEPENDENTLY ON A CASE-BY-CASE BASIS. THE IMPORTANCE THE FRENCH PLACE ON EXPORTING IS ONE OF THE REASONS WHY IT WOULD BE DIFFICULT TO PERSUADE THEM TO GIVE UP THEIR PRESENT FREEDOM OF ACTION BY ACCEPTING INTERNATIONAL SAFEGUARDS. THE FRENCH ALSO WISH TO AVOID ALIENATING THEIR THIRD WORLD CLIENTS BY MEMBERSHIP IN A "CLUB" OF ADVANCED NATIONS SEEKING TOGETHER TO LIMIT THE SPREAD OF NUCLEAR TECHNOLOGY AND MATERIAL. FUTURE FRENCH ADHERENCE TO THE NPT SEEMS OUT OF THE QUESTION FOR POLITICAL REASONS,

CERTAINLY UNTIL THE OTHER EUROPEAN POWERS RATIFY
THE NPT, AND PROBABLY NOT EVEN THEN.

30. SEEK INTERNATIONAL COOPERATION ON NUCLEAR
RESEARCH AND DEVELOPMENT: ANOTHER CONSEQUENCE OF
FRANCE'S MEDIUM SIZE IS ITS NEED TO SECURE FI-
NANCIAL AND TECHNICAL PARTICIPATION FROM FOREIGN
PARTIES IN COSTLY RESEARCH AND DEVELOPMENT PROJECTS.
THE GENERAL TENDENCY IS TO WORK BILATERALLY WITH
THE U.S. TO GAIN SCIENTIFIC AND INDUSTRIAL
EXPERTISE, AND MULTILATERALLY WITHIN EUROPE TO
SECURE FINANCIAL AND MARKETING ADVANTAGES.

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FM AMEMBASSY PARIS

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INFO AMEMBASSY BONN

AMEMBASSY MADRID

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(OF COURSE, THE FRENCH ALSO PARTICIPATE IN MULTINATIONAL ORGANIZATIONS SUCH AS EURATOM, IAEA, AND CERN, AND CONDUCT A BROAD COOPERATIVE PROGRAM ASSISTING THIRD WORLD NATIONS, PARTICULARLY INDIA, TO FURTHER FRENCH POLITICAL INFLUENCE, PRESUMABLY TOO WITH AN EYE TOWARD FUTURE UNCLASSIFIED

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SALES.)

31. THE FRENCH HAVE CLOSE RELATIONS WITH U.S. PRIVATE ENTERPRISES. THE DEPENDENCE ON WESTINGHOUSE AND GE REACTOR LICENSES HAS BROUGHT THE GOVERNMENT INCREASING CRITICISM FROM THE UNIONS, THE POLITICAL LEFT, AND INDEED, THE GENERAL PUBLIC. THE TEMPTATION EXISTS TO USE A FRENCH DESIGN OF THE LIGHT WATER REACTOR. THIS STEP, HOWEVER, WOULD DEPRIVE THE FRENCH OF ACCESS TO THE TECHNICAL ADVANCES WESTINGHOUSE CONTINUES TO MAKE, BASED ON ITS OPERATING EXPERIENCE AND RESEARCH. NEVERTHELESS, THE OPTION GIVES THE FRENCH AN ASSET FOR NEGOTIATING CONCESSIONS FROM WESTINGHOUSE IN SUCH AREAS AS OVERSEAS SALES, LICENSE FEES, AND INCREASED CAPITALIZATION OF FRAMATONE, IN WHICH WESTINGHOUSE HAS A SHARE OF 45 PERCENT.

32. THE TECHNOLOGY FLOW IS NOT ONE-WAY. U.S. FIRMS, E.G., GENERAL ELECTRIC AND STONE & WEBSTER, ARE SHOWING INTEREST IN THE POSSIBILITIES OF WORKING WITH THE TECHNICAL COMMISSION ON THE FRENCH FAST BREEDER DEVELOPMENT PROGRAM. ANOTHER AREA OFFERING MUTUAL BENEFITS IS COOPERATION ON A GOVERNMENT-TO-GOVERNMENT LEVEL. THE CEA HAS SIGNED TWO AGREEMENTS FOR COOPERATION WITH THE USAEC SINCE LAST JUNE; ONE, ON REGULATION EXCHANGE AND STANDARDS RESEARCH; THE OTHER, ON LIGHT WATER REACTOR SAFETY. IN ADDITION, THERE IS A CONTINUOUS FLOW OF TECHNICAL EXPERTS FROM BOTH SIDES VISITING FACILITIES AND EXCHANGING INFORMATION.

33. RELATIVE TO EUROPE, FRENCH NUCLEAR CAPABILITIES

ARE IN THE FOREFRONT, PERHAPS EVEN SURPASSING GER-
MANY'S AND THE UK'S. IN ADDITION, COMMERCIAL
COMPETITION IS SHARP. THUS THE FRENCH TURN TOWARD
EUROPEAN COOPERATION MORE TO FINANCE COSTLY DEVELOP-
MENT PROGRAMS THAN TO AUGMENT THEIR TECHNICAL EX-
PERTISE. FOR THE EURODIF ENRICHMENT PLANT (NOT
INCLUDING THE POWER REACTORS) THE BELGIAN, ITALIAN
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AND SPANISH PARTNERS WILL ASSUME ABOUT HALF THE
COSTS. THE TECHNOLOGY IS FRENCH. FOR THE SUPER-
PHENIX FAST BREEDER POWER STATION, EDF WILL ASSUME
51 PERCENT OF \$500 MILLION COSTS, ENEL OF ITALY
33 PERCENT, AND RWE OF GERMANY 16 PERCENT. THE
TECHNOLOGY WILL AGAIN BE FRENCH, WITH SOME TECHNICAL
PARTICIPATION BY ITALY. THE FRENCH ARE ALSO
INTERESTED IN WORKING THROUGH A EUROPEAN CON-
SORTIUM TO MARKET HIGH TEMPERATURE GAS REACTOR
POWER STATIONS OUTSIDE OF FRANCE. IN THE FIELD OF
REPROCESSING, THE FRENCH HAVE DEVELOPED A CONSORTIUM,
UNITED REPROCESSORS, WITH THE UK AND GERMANY, TO
COORDINATE BUILDING AND MARKETING PLANS. IN
HIGH ENERGY PHYSICS, THE SAME COUNTRIES HAVE
JOINED FRANCE IN THE LAUE-LANGEVIN HIGH FLUX REACTOR
AT GRENOBLE.

34. THE FRENCH WOULD LIKE TOO TO DEVELOP SOME
SORT OF COOPERATIVE RELATIONSHIP WITH THE SOVIETS
TO GAIN ACCESS TO A LARGE POTENTIAL MARKET IN
THE SOVIET UNION AND EASTERN EUROPE. DESPITE PER-
SISTENT RUMORS OF BILLION DOLLAR REACTOR SALES,
RESULTS HAVE NOT YET ADVANCED BEYOND A RELATIVELY
SMALL BILATERAL SCIENTIFIC COLLABORATION IN NUCLEAR
ENERGY.

35. CONCLUSION: INDEPENDENCE IN AN INTERNATIONAL
INDUSTRY

AS CEA DIRECTOR ANDRE GIRAUD HAS OFTEN SAID,
THE NUCLEAR INDUSTRY IS INTERNATIONAL. FRANCE IS
NO EXCEPTION. ITS MINING CONCERNS SEARCH FOR
URANIUM IN AFRICA, IRAN, CANADA, EVEN THE U.S. ITS
PLANS FOR BUILDING ENRICHMENT PLANTS DEPEND ON
EUROPEAN FINANCING AND PERHAPS SITES IN CANADA
OR AUSTRALIA. ITS POWER REACTORS WERE DESIGNED
IN THE U.S., ITS EXPORTS OF REACTORS, URANIUM, AND
EVENTUALLY ENRICHMENT SERVICES WILL BE VIRTUALLY

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FM AMEMBASSY PARIS

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WORLD-WIDE. IN ADDITION, FRANCE, LIKE THE U.S.,
REALIZES THAT A SERIOUS NUCLEAR ACCIDENT ANY-
WHERE IN THE WORLD COULD SET BACK MULTIBILLION
DOLLAR PLANS TO BUILD NEEDED POWER CAPACITY.

36. WHAT THEN DOES INDEPENDENCE MEAN IN RELATION

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TO AN INDUSTRY SO INHERENTLY INTERNATIONAL?
FOR THE FRENCH, IT MEANS HAVING AN IMPORTANT IN-
FLUENCE ON EVENTS THAT AFFECT ITS VITAL NATIONAL
INTERESTS. IT MEANS AVOIDING SITUATIONS WHERE
FOREIGN COUNTRIES CAN MONOPOLIZE THE SUPPLY OF
NATURAL URANIUM OR ENRICHMENT SERVICES. IT ALSO
MEANS HAVING FREEDOM TO ADVANCE FRENCH POLITICAL
AND COMMERCIAL OBJECTIVES ABROAD.

37. THERE IS LITTLE EVIDENCE THAT THE FRENCH WILL
DEVIATE SIGNIFICANTLY FROM THE DIRECTIONS NOW SET.
THE CEA MAY GET A NEW ADMINISTRATOR IF ANDRE GIRAUD
STEPS DOWN WHEN HIS PRESENT 5-YEAR APPOINTMENT EX-
PIRES IN OCT 1975; HIS DEPUTY PECQUEUR, IS A POSSIBLE
REPLACEMENT. HOWEVER, THE BASIC MOTIVATIONS OF
FRENCH NUCLEAR POLICIES WILL PROBABLY REMAIN UN-
CHANGED.

FRANCE COULD BECOME AN IMPORTANT COMMERCIAL
RIVAL FOR THE U.S. IN THE INTERNATIONAL NUCLEAR
MARKET IN THE 1980'S. THE WEIGHT OF ITS NUCLEAR
INVESTMENT OVER THE PAST YEARS IN MONEY AND MEN
AS WELL AS ITS DETERMINED NUCLEAR DIPLOMACY AUGURS
FOR INCREASED FRENCH PRESENCE IN THIS INTER-
NATIONAL INDUSTRY. THIS FORECAST DOES NOT CALL FOR
OPPOSITION FROM THE U.S. BUT HEALTHY COMPETITION
AND COOPERATION. WITH INCREASING CONFIDENCE IN ITS
NUCLEAR EXPORT CAPABILITY, FRANCE COULD FOR EXAMPLE
BECOME MORE AMENABLE TO COORDINATING ITS SAFE-
GUARDS ON NUCLEAR EXPORTS WITH OTHER NUCLEAR STATES.
IT SHARES THE OBJECTIVE OF LIMITING PROLIFERATION OF
NUCLEAR EXPLOSIVE CAPABILITY. SIMILARLY, BOTH THE
U.S. AND FRANCE STAND TO GAIN FROM COORDINATING
NUCLEAR POLICIES ON ENRICHMENT, ADVANCED
REACTOR DEVELOPMENT LIKE THE FAST BREEDER, EN-
VIRONMENTAL PROTECTION, AND SAFETY TO AVOID DUPLI-
CATION AND TO PROFIT FROM EACH OTHER'S EXPERTISE.
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